UIPE JC67 JUN 23 2004

Fig.1

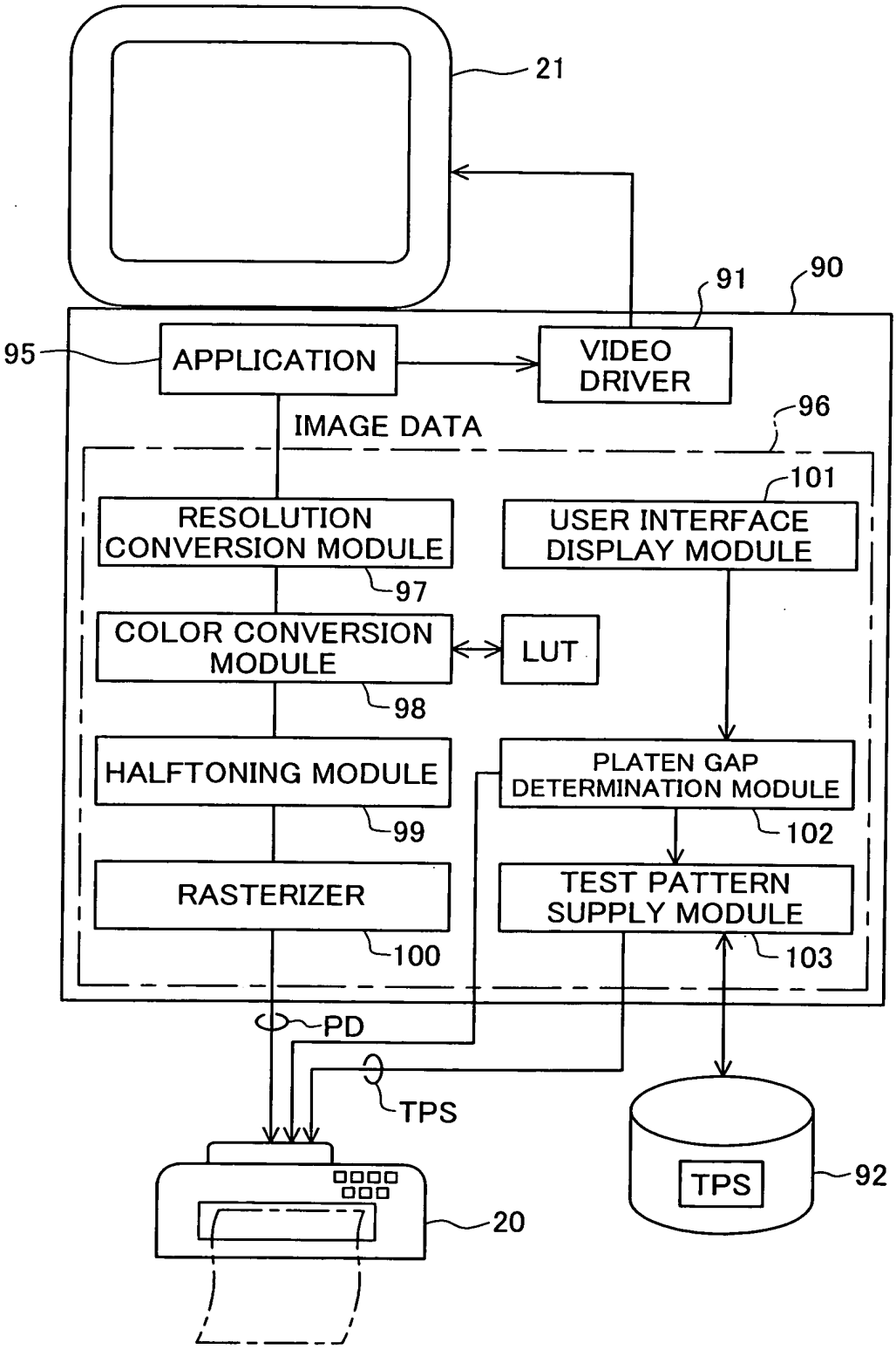


Fig.2

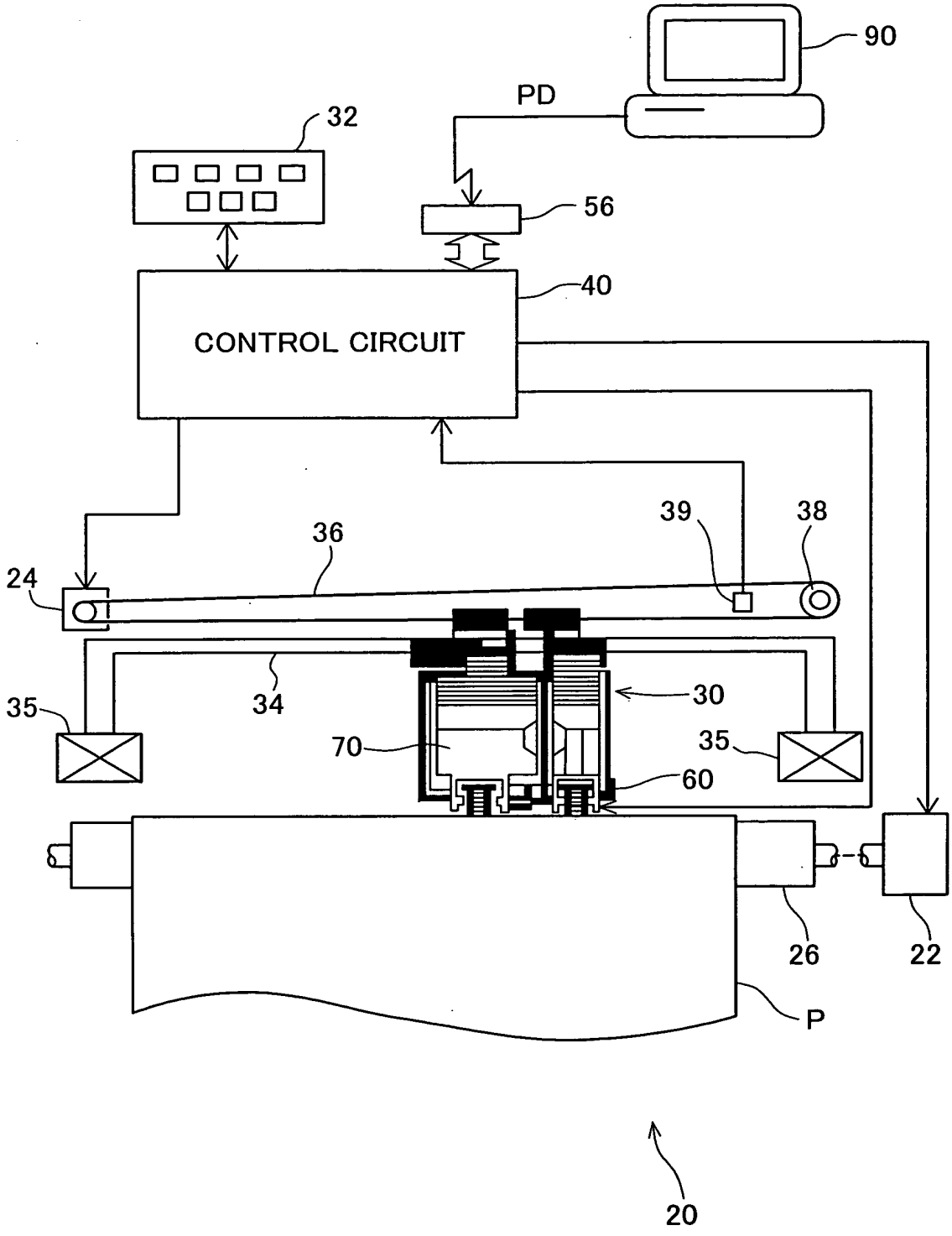

90
PD
32
56
40
CONTROL CIRCUIT
39
38
36
24
34
30
35
70
35
60
26
22
P
20

Fig.3

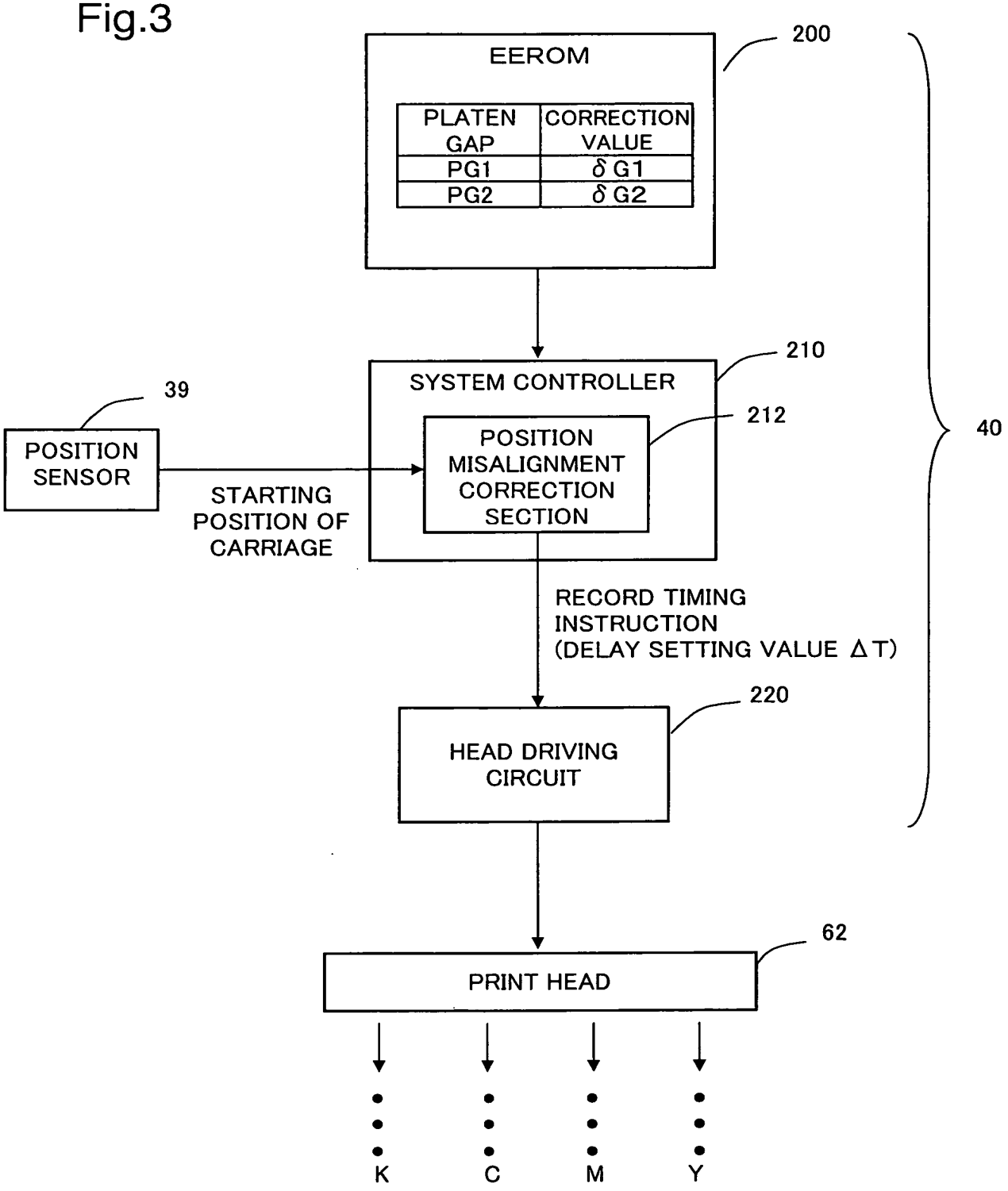

EEROM
200
PLATEN GAP
CORRECTION VALUE
PG1
δ G1
PG2
δ G2
SYSTEM CONTROLLER
210
212
POSITION MISALIGNMENT CORRECTION SECTION
39
POSITION SENSOR
STARTING POSITION OF CARRIAGE
40
RECORD TIMING INSTRUCTION (DELAY SETTING VALUE ΔT)
220
HEAD DRIVING CIRCUIT
62
PRINT HEAD
K
C
M
Y

Fig.4

PLATEN GAP AND BI-DIRECTIONAL PRINTING MISALIGNMENT CORRECTION VALUE (FIRST EMBODIMENT)

PRINT MODE	PRINT MEDIUM	PLATEN GAP PG	PRINT RESOLUTION (MAIN SCAN × SUB SCAN)	CARRIAGE SPEED	MONOCHROME /COLOR	BI-DIRECTIONAL PRINT CORRECTION VALUE δ
1	PHOTO PRINT PAPER	PG1 = 0.9mm	720×720 dpi	240 cps	MONOCHROME	δ G1m1
2					COLOR	δ G1c1
3			1440×720 dpi	240 cps	MONOCHROME	δ G1m2
4					COLOR	δ G1c2
5			2880×1440 dpi	200 cps	MONOCHROME	δ G1m3
6					COLOR	δ G1c3
7	REGULAR PAPER	PG2 = 1.5mm	720×720 dpi	240 cps	MONOCHROME	δ G2m1
8					COLOR	δ G2c1
9			1440×720 dpi	240 cps	MONOCHROME	δ G2m2
10					COLOR	δ G2c2
–			2880×1440 dpi	200 cps	MONOCHROME	–
–					COLOR	–

Each correction value is set based on test pattern suitable for each mode.

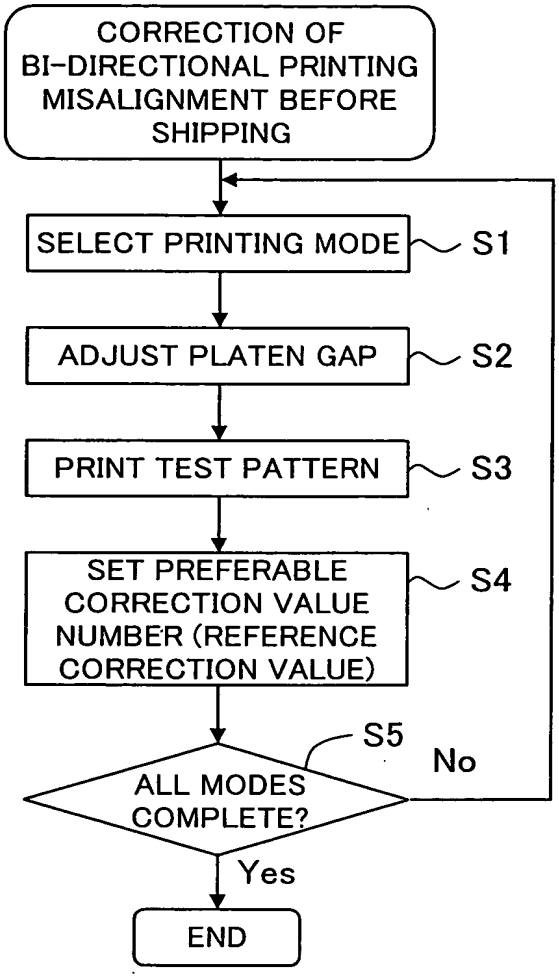
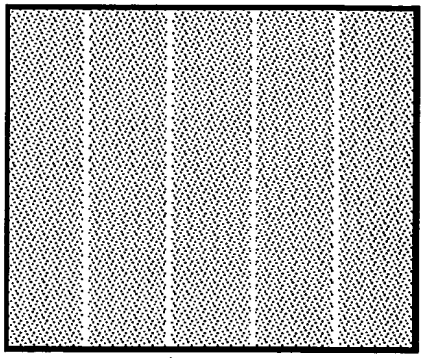

CORRECTION OF BI-DIRECTIONAL PRINTING MISALIGNMENT BEFORE SHIPPING
SELECT PRINTING MODE
S1
ADJUST PLATEN GAP
S2
PRINT TEST PATTERN
S3
SET PREFERABLE CORRECTION VALUE NUMBER (REFERENCE CORRECTION VALUE)
S4
S5
ALL MODES COMPLETE?
No
Yes
END

Fig.5

Fig.6

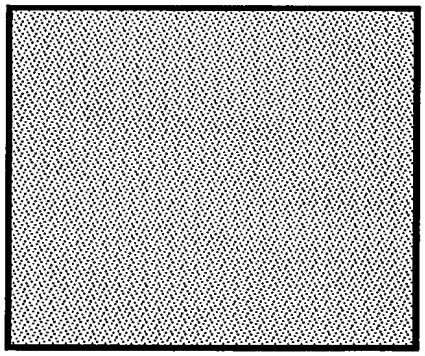
TEST PATTERN WITH COLOR PATCHES
FOR BI-DIRECTIONAL PRINT MISALIGNMENT

CORRECTION VALUE NUMBER=1
(CORRECTION VALUE δ =0)

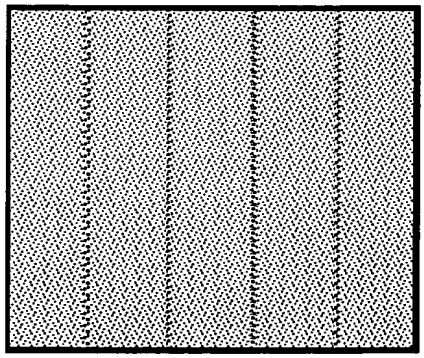


WHITE STREAK

CORRECTION VALUE NUMBER=2
(CORRECTION VALUE δ =1)



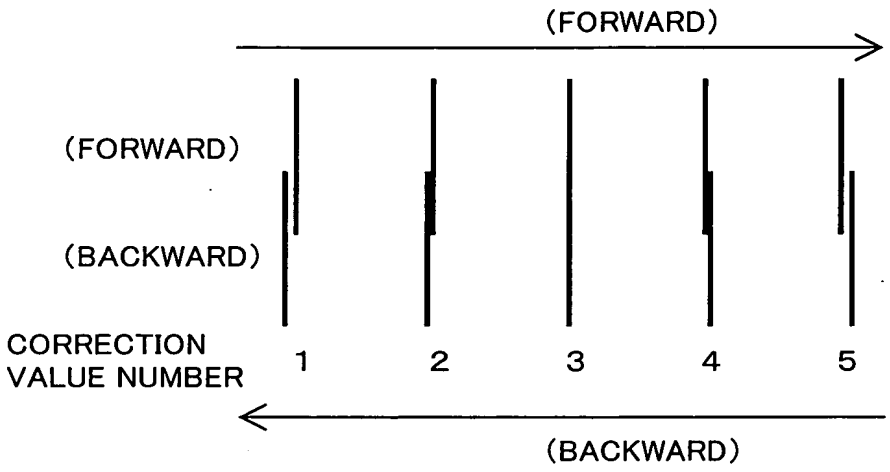
CORRECTION VALUE NUMBER=3
(CORRECTION VALUE δ =2)



BLACK STREAK

Fig.7

TEST PATTERN WITH VERTICAL RULED LINES
FOR BI-DIRECTIONAL PRINT MISALIGNMENT



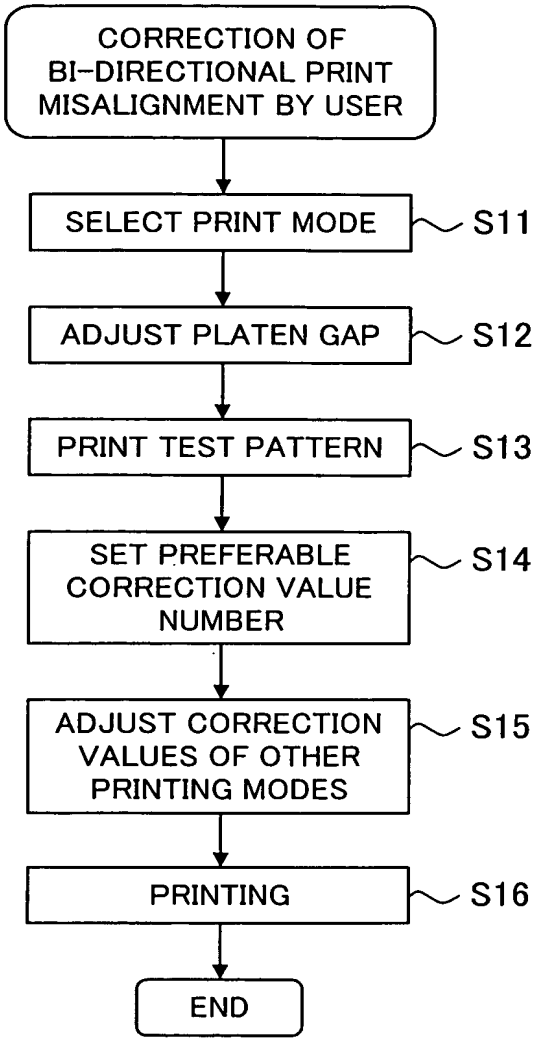

CORRECTION OF BI-DIRECTIONAL PRINT MISALIGNMENT BY USER
SELECT PRINT MODE
S11
ADJUST PLATEN GAP
S12
PRINT TEST PATTERN
S13
SET PREFERABLE CORRECTION VALUE NUMBER
S14
ADJUST CORRECTION VALUES OF OTHER PRINTING MODES
S15
PRINTING
S16
END

Fig.8

Fig.9

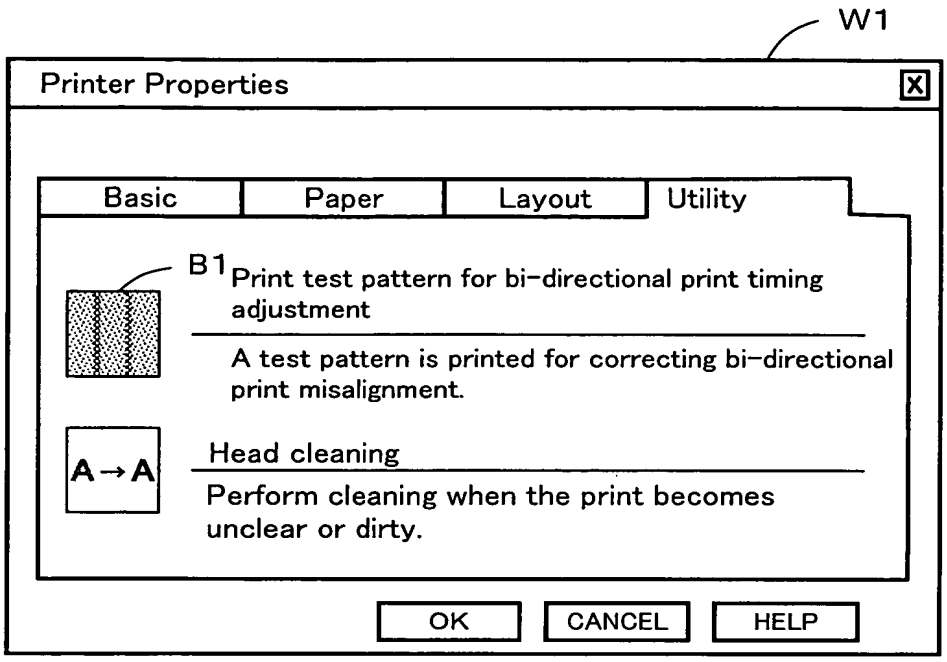

W1
Printer Properties
Basic
Paper
Layout
Utility
B1
Print test pattern for bi-directional print timing adjustment
A test pattern is printed for correcting bi-directional print misalignment.
A→A
Head cleaning
Perform cleaning when the print becomes unclear or dirty.
OK
CANCEL
HELP

Fig.10

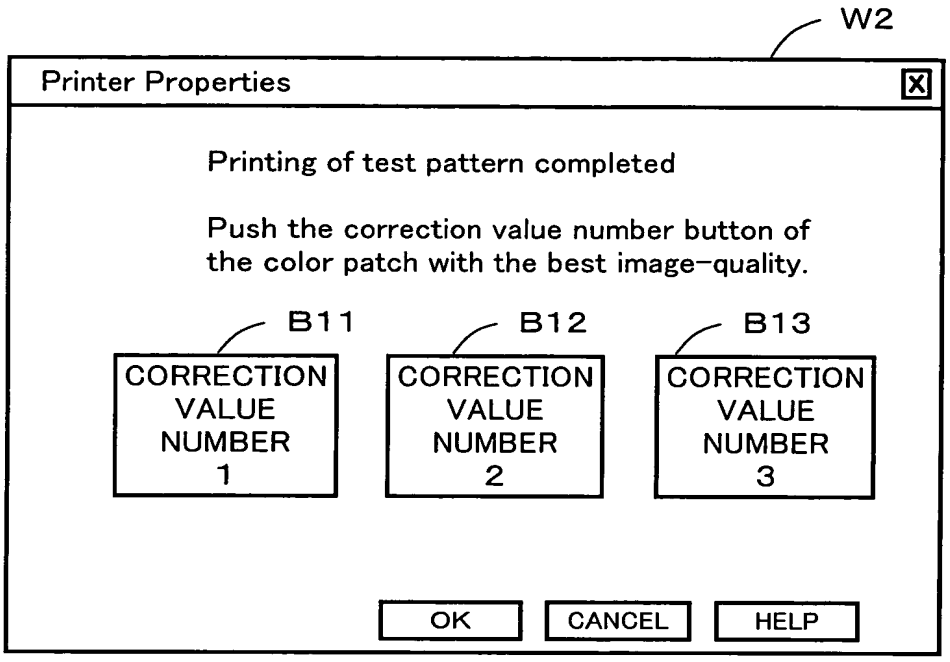

W2
Printer Properties
Printing of test pattern completed
Push the correction value number button of the color patch with the best image-quality.
B11
B12
B13
CORRECTION VALUE NUMBER 1
CORRECTION VALUE NUMBER 2
CORRECTION VALUE NUMBER 3
OK
CANCEL
HELP

Fig.11

ADJUSTMENT OF MISALIGNMENT CORRECTION VALUE

PRINT MODE	PRINT MEDIUM	PLATEN GAP PG	PRINT RESOLUTION (MAIN SCAN × SUB SCAN)	CARRIAGE SPEED	MONOCHROME/ COLOR	CORRECTION VALUE δ IN BI-DIRECTIONAL PRINTING
1	PHOTO PRINT PAPER	PG1 = 0.9mm	720×720 dpi	240 cps	MONOCHROME	δ G1m1 → δ G1m1' (Change)
2					COLOR	δ G1c1 (Adjustment)
3			1440×720 dpi	240 cps	MONOCHROME	δ G1m2 (Adjustment)
4					COLOR	δ G1c2 (Adjustment)
5			2880×1440 dpi	200 cps	MONOCHROME	δ G1m3
6					COLOR	δ G1c3
7	REGULAR PAPER	PG2 = 1.5mm	720×720 dpi	240 cps	MONOCHROME	δ G2m1
8					COLOR	δ G2c1
9			1440×720 dpi	240 cps	MONOCHROME	δ G2m2
10					COLOR	δ G2c2
–			2880×1440 dpi	200 cps	MONOCHROME	–
–					COLOR	–

In response to change from δ g1m1 to δ g1m1', correction values for bi-directional print modes which have the same platen gap PG and carriage speed are changed as follows;

$\delta G1c1' \leftarrow \delta G1c1 + (\delta G1m1' - \delta G1m1)$

$\delta G1m2' \leftarrow \delta G1m2 + (\delta G1m1' - \delta G1m1)$

$\delta G1c2' \leftarrow \delta G1c2 + (\delta G1m1' - \delta G1m1)$

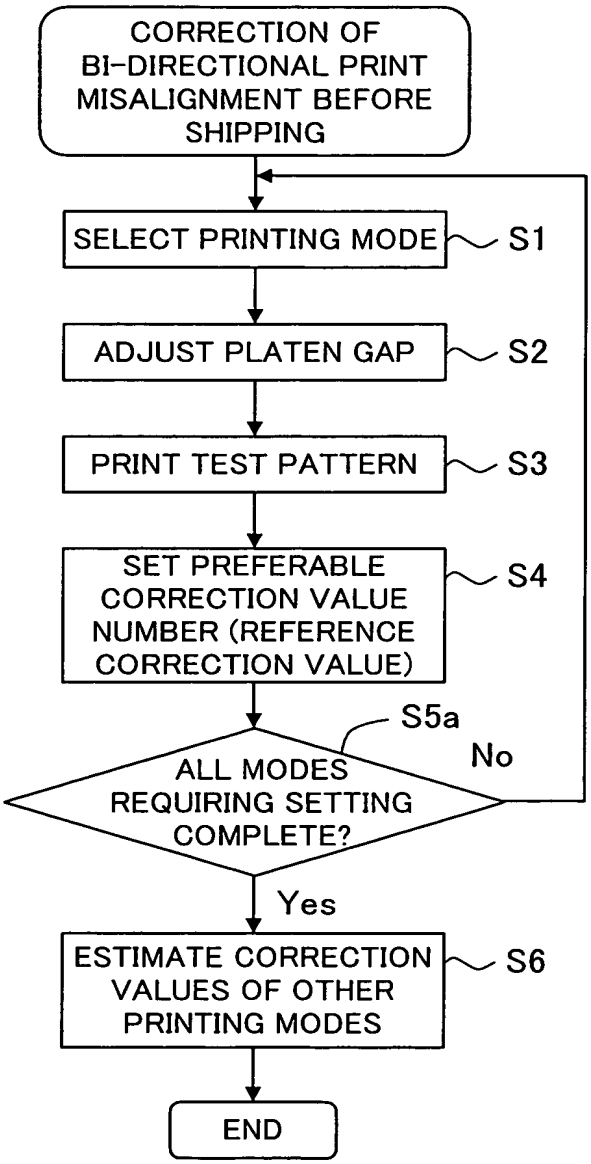

CORRECTION OF BI-DIRECTIONAL PRINT MISALIGNMENT BEFORE SHIPPING
SELECT PRINTING MODE
S1
ADJUST PLATEN GAP
S2
PRINT TEST PATTERN
S3
SET PREFERABLE CORRECTION VALUE NUMBER (REFERENCE CORRECTION VALUE)
S4
S5a
ALL MODES REQUIRING SETTING COMPLETE?
No
Yes
ESTIMATE CORRECTION VALUES OF OTHER PRINTING MODES
S6
END

Fig.12

Fig.13

PLATEN GAP AND BI-DIRECTIONAL PRINT MISALIGNMENT CORRECTION VALUE (SECOND EMBODIMENT)

PRINT MODE	PRINT MEDIUM	PLATEN GAP PG	PRINT RESOLUTION (MAIN SCAN × SUB SCAN)	CARRIAGE SPEED	MONOCHROME /COLOR	BI-DIRECTIONAL PRINT CORRECTION VALUE δ
1	PHOTO PRINT PAPER	PG1 = 0.9mm	720×720 dpi	240 cps	MONOCHROME	δ G1m1
2					COLOR	δ G1c1
3			1440×720 dpi	240 cps	MONOCHROME	δ G1m2
4					COLOR	δ G1c2
5			2880×1440 dpi	200 cps	MONOCHROME	δ G1m3
6					COLOR	δ G1c3
7	REGULAR PAPER	PG2 = 1.5mm	720×720 dpi	240 cps	MONOCHROME	δ G2m1
8					COLOR	δ G2c1
9			1440×720 dpi	240 cps	MONOCHROME	δ G2m2
10					COLOR	δ G2c2
–			2880×1440 dpi	200 cps	MONOCHROME	–
–					COLOR	–

Set with test pattern

Estimated correction values

$$\delta G2c1 = \delta G1c1 + (\delta G2m1 - \delta G1m1)$$
$$\delta G2c2 = \delta G1c2 + (\delta G2m2 - \delta G1m2)$$